

REMARKS

Reconsideration of the above-identified application in view of the above amendments and remarks following is respectfully requested.

Claims 10 - 14, 16 - 23, 25 - 32 and 51 - 57 are now before the examiner.

New claims 54 - 57 have been added.

The independent claims have been amended to indicate the alkyl substituent is a linear or iso alkyl group.

The word "type" has been deleted from the claims to facilitate prosecution. In each of claims 27, 32 and 53 the definition of "f" now includes -- 1 --. Support for the amendment is found at page 6, line 5. In the same claims the method of measuring the MI is now indicated. Support is found at page 18 of the application.

Claims 10 - 14, 16 - 23, 25 - 32 and 51 - 53 have been rejected under 35 U.S.C. 112, second paragraph. The examiner believes the word "type" is indefinite, the term "bulky" causing the scope of the claims to be indeterminate, the melt index did not have a method of being measured and that $f=0$ rendered the description of R'' meaningless.

This rejection is traversed in view of the claim amendments and the position as follows. The word "type" has been deleted from all the claims. The symbol "f" now equals 0 or 1. The method of measuring the MI is now indicated. It is respectfully submitted that the word "bulky" as employed in this application is clear and definite. At page 1, lines 9 – 16, bulky ligands are defined. A well-known definition is: ligands capable of η -5 bonding to the transition metal. Further descriptions of "bulky" are found on page 2 and 4. In view of the amendments above and the position with respect to bulky, it is respectfully submitted that the claims unequivocally satisfy the requirements of 35 U.S.C. 112. Withdrawal of the rejection is respectfully requested.

As discussed in Applicants' response mailed July 7, 1999, it is well known in the art that hafnocene catalysts obtain high molecular weight polymer product, but manifest relatively poor activity as compared with the titanocene and zirconocene catalyst systems. In accordance with Applicants' invention, it was discovered that hafnocene based catalyst systems containing the alkyl substituents as defined in the amended claims manifest highly improved activity. This improved activity is submitted to be highly unexpected as compared with the activity of hafnocene catalysts not containing the certain alkyl groups. It is respectfully urged that there is nothing in the prior art, which would lead one of ordinary skill to predict the catalytic activity of applicants' hafnocenes, said activity being substantially greater over similar hafnocenes not containing the certain alkyl groups. Table 1 found on page 24 of the application shows that the catalysts in accordance with the claimed invention obtain activities that are about 50 times greater and yields that are about 10 to 20 times greater as compared with hafnocenes not in accordance with the claimed invention. The unexpectedness and unobviousness is all the more clear when one notes that the improved activity and yields were obtained without loss of the high molecular range that is desirably obtained.

Claims 10 - 12, 14, 16, 28 - 30, 51 and 52 have been rejected under 35 U.S.C 102 (e) as being anticipated by Harrington. This rejection is respectfully traversed. The substituents on the Cp ring in each of examples 1, 2 and 3 of Harrington are t-butyl. The instant claims do not read on t-butyl. Furthermore, new claim 54 is further removed from Harrington because Harrington's compounds are mono Cps whereas claim 54 is a bis Cp. It is further respectfully submitted that the claims in question are unobvious in the sense of 35 U.S.C. 103 over Harrington. Harrington's invention is directed toward the preparation of high crystalline cyclic olefin copolymers. There is no teaching or suggestion that any hafnocene would manifest high activity while still producing a high molecular weight (MW) polymer product. Withdrawal of the rejection is respectfully asked.

Claims 10 - 14, 16, 27, 32 and 51 - 53 have been rejected under 35 U.S.C. 102 (b) as being anticipated by Doyle et al. (Doyle). This rejection is respectfully traversed. As in Harrington, the substituent on the Cp ring is tert-butyl. The instant claims do not read on tert-butyl. It is therefore respectfully submitted that a rejection under 35 U.S.C. 102 be withdrawn.

It is further submitted that a rejection under 35 U.S.C. 103 does not apply. Doyle is directed toward a process utilizing two different catalysts. The use of two different catalysts would not make obvious Applicants' invention as described above. Withdrawal of the rejection is respectfully asked.

Claim 19 has been rejected under 35 U.S.C. 103 (a) as being unpatentable over Harrington. This rejection is respectfully traversed. For reasons discussed above, it is maintained that the claims from which claim 19 depend are not obvious and hence claim 19 should not be obvious. Withdrawal of the rejection is respectfully asked.

Claim 17, 20 and 28 - 31 have rejected under 35 U.S.C. 103 (a) as being unpatentable over Doyle et al. (Doyle). As discussed above, Doyle does not include all the claimed process limitation. As argued above, the main claims are neither anticipated nor obvious. Hence, the claims dependent therefrom should be neither anticipated nor obvious. Withdrawal of the rejection is respectfully asked.

Claims 18, 19, 21 - 23, 25 and 26 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Doyle et al. Optionally in view of Tsutsui. This rejection is respectfully traversed. Neither of the references discloses the particular alkyl groups required in accordance with Applicants' invention as claimed. Neither of the references addresses the catalytic activity obtained employing the hafnocenes of the invention. It is respectfully submitted that, absent any teaching suggesting the hafnocenes, the instant claims are not obvious under Doyle and Tsutsui.

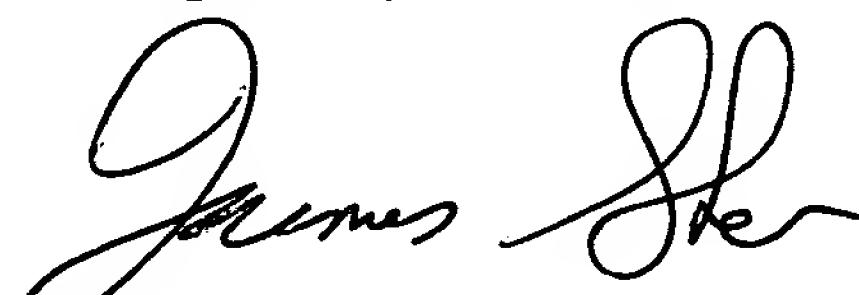
Claims 10 - 14, 16 - 23, 25, 26, 28 - 31 and 51 - 53 have been rejected under 35 U.S.C. 103 (a) as being unpatentable over Jejelowo et al. (Jejelowo). This rejection is respectfully traversed. The Examiner admits that the reference does not contain a working example wherein hafnium is used. Furthermore, it is respectfully submitted that the patent does not list hafnocenes falling within the scope of the instant claims. The examiner suggests that "one of ordinary skill in the art would be motivated to use it, with reasonable success expected." Although hafnocenes are well known and one would expect some success in using such catalysts as an olefin polymerization catalyst one must determine what success is being addressed. Jejelowo addresses

obtaining broad molecular weight. One therefore would be motivated to employ Jejelowo's catalysts for obtaining broad molecular weight polymers. Applicants' invention is directed toward obtaining increased activity. Such increase in activity is clearly demonstrated in Applicants' examples. Since Jejelowo does not specifically mention applicants' hafnocenes, and since the objectives of one from the other are so very different, it is respectfully submitted there is no motivation found in Jelelwo to use Applicant's hafnocenes in order to obtain increased catalytic activity. Absent the motivation and an expectation of reasonable success to obtain increased catalytic activity, it is deemed that the claims are not obvious in the sense of 35 U.S.C.103. Withdrawal of the rejection is respectfully asked.

The examiner suggests that a fair comparison is between the hafnocenes and the zirconocenes. It is respectfully submitted that the examiner errs. First of all, as stated above, Applicants are not merely claiming hafnocenes with substiuents having from 3 - 5 carbon atoms; Applicants are claiming hafnocenes that have linear or iso substiuents. Applicants obtain better activity without affecting the high molecular weight; Jejelovo merely discloses properties associated with molecular weight distribution (MWD) and MW. Jejelovo does not disclose the specific hafnocenes recited in the instant claims. Applicants' invention does not involve the discovery that hafnocenes can have better activity than zirconocenes. Applicants' unexpected discovery is that certain hafnocenes will manifest improved activity over the known prior art hafnocenes. It is therefore submitted that the closest prior art to be compared against are hafnocenes and applicants have done just that.

In view of the above amendments and remarks, it is respectfully submitted that the claims are in condition for allowance. Prompt notice of allowance is respectfully solicited.

Respectfully submitted,



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